

## Book and video reviews

### **Zebrafish: A Practical Approach**

2002. By C. Nüsslein-Volhard and R. Dahm.  
ISBN: 0199638098/019963808X. Pp xviii + 303.  
Oxford University Press. £80 hardback; £40  
paperback

In the last 10 years, the small tropical zebrafish *Danio rerio* has been the centre of an explosion of research activity. Its small size, rapid generation time and fecundity make it well suited to genetic analysis. Additional advantages—such as the optical clarity of its embryo, and the development of techniques to manipulate its ploidy—have made the zebrafish the organism of choice for the first large-scale forward mutagenesis screens of any vertebrate species. These and other screens have yielded a host of mutant lines, many of which form important models of human disease. To underline this success, much effort has been put into the development of genetic and genomic tools for the zebrafish, and the genome sequence is well on the way to being completed.

With the rapid expansion of the zebrafish research community has come the demand for practical guides on the subject. This is one that excels in clarity. As part of the 'Practical Approach' series, it presents a large range of the most powerful and commonly used methods in zebrafish research, and is written by experts in the relevant techniques. Protocols are clearly signposted in boxes, each with a list of equipment and reagents in addition to the detailed method. This uniform style sets it apart from other manuals currently on offer. In addition, it includes some of the more up-to-date techniques, such as morpholino injection or photoactivation of caged dyes, not found in earlier manuals.

The book assumes no prior knowledge, and gives all the information that would be needed to set up a new zebrafish laboratory from scratch, including a chapter on fish husbandry and health. An introductory chapter sets the zebrafish in the context of other commonly used genetic model organisms, with a brief history of its rapid rise to fame. The organization of the book's content is slightly peculiar, with a staging atlas for the observation of live embryos being given in the Appendix (perhaps because it is so well covered elsewhere), whereas the chapter entitled 'Looking at embryos' is mainly a series of techniques for staining and analysing fixed material. A guide to the morphology of the adult animal, however, is presented as a main chapter. This is particularly useful, bringing together much information that is not available elsewhere or in such a unified presentation.

The chapter on cell labelling and transplantation is also covered in more depth than in other texts. Characteristic of the author, Don Kane, it is full of delightful detail, right down to

the advice to water your cactus plant now and again in order to obtain the choicest spines (used as microsurgical knives for embryo dissection). Two chapters on mutagenesis, mapping and cloning set out how to do forward genetic screens and identify mutations at the end of the process. Examples of real mapping data are provided throughout.

The illustrations, on the whole, are of very high quality and broad ranging: they include photographs of laboratory equipment, detailed camera lucida drawings of live embryos and larvae, photographs of actual data, and examples of notebook pages with advice on how to record the results of experiments. Often, they have been carefully chosen to illustrate a point; there is a useful comparison, for example, of the degrees of mosaicism of expression seen after RNA and DNA injection, compared with a stably expressing transgenic line. A set of colour plates enhances the black-and-white photographs and line drawings throughout the text.

Appendices include a list of all currently known zebrafish mutant strains, with a brief phenotype description for each. The indexing—vital in any reference manual—is generally very good, although somewhat cluttered with mutant names, which I found rather superfluous, since these appear anyway in the Appendix in alphabetical order. Mutant names in the Index could have been limited to those that appear in the text of the book. Referencing is good, with each chapter providing useful citations of the primary literature.

In summary, *Zebrafish: A Practical Approach* should prove to be a popular manual. It will be especially useful to those wishing to set up a new zebrafish laboratory, or to a student or postdoctoral student entering the field for the first time. However, it also contains much information that will be useful to those already familiar with the system, and should be a well-thumbed addition to the bookshelf of any zebrafish laboratory.

Tanya Whitfield

### **The Laboratory Rat: A Natural History**

2002. By M. Berdoy. Film (27 min) available on VHS, CD, DVD. £10.00. Information and prices on [www.RATLIFE.org](http://www.RATLIFE.org)

This documentary video of about 25 min in length studies the fate of 50 or so young laboratory rats over a period of several months, following their release into a wild-type environment. Their compound is a farmyard-type environment, enclosed but open to the elements, providing a semi-protected free-range habitat. The subjects are standard Wister albinos and the smaller but dark-eyed Lister Hooded rats of both sexes. No food is provided so animals are expected to find their own food and shelter.

The purpose is to find out whether laboratory-raised rats, bred to be docile in

comparison to their wild cousins, can adapt to life in the free world and to see how they will fare in their new environment. In fact, as the documentary shows, they adapt very well. The rats soon form a complex society, breed and increase in number. They look as if they are thriving well on their new diet and enjoying their new lifestyle.

The film examines a number of issues relevant to those who keep rats in captivity. Although they never becomes as 'wild' as genuinely wild rats, the free-range rats develop increasingly wary behaviour patterns. We see their behaviour in relation to predators and rival rats from outside the colony. We learn about their food selection and their choice of a healthy diet. We see how the rats adapt to their new habitat, borrowing and nesting and finding their way around. There is discussion about their communication and mate selection, how the young are raised and the problems of infanticide.

I feel that this film should appeal to more than one audience. It shows that the laboratory rat, despite its selective breeding for docility, still has the evolutionary complexity and needs of a wild rat. This should be of particular interest to laboratory workers, scientists and zoologists who may never have seen a rat outside of a small and restrictive cage environment. It should also appeal to the growing number of people who keep rats as pets or for showing, although the behaviour may come as no surprise to those of us who have kept rats as pets. Similar kinds of behaviours are seen regularly in the living rooms of many a pet rat lover. Nevertheless, there are some interesting insights, and most rat lovers will enjoy the film for

its excellent photography and its sympathetic approach to their favourite creatures.

I enjoyed this video immensely. The filming and the commentary are professionally done, there are some charming shots of rats in action, and there is even a little suspense and a touch of humour. It is refreshing to watch a rat wildlife film that is sympathetic to the animals and not portraying them as simply unsavoury or dangerous rivals to mankind.

If I have any complaint it would be that the film was not long enough. I have a long attention span on the subject of rats and would have been interested in things the film did not show: the reasons behind the predominance of white rats in the mating chase, for example. I feel that there was more to the rats' social behaviour than is obvious in the film. I would like to have seen more of the rats' hideaway in the straw bales and the social organization within borrows and within the colony as a whole. I would also like to know whether the behaviour changes would increase in further generations—a greater rise in neophobia for example. Nevertheless, this short film does explore quite adequately the issues it seeks to cover.

This video may find a use as a training aid, especially within the scientific community—perhaps within the ethics section of the licensee training courses. It may be of particular use with student courses. Otherwise it stands on its own as a well-produced and entertaining film for anyone involved with rats in any capacity.

R. Rodham